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FLOOD INSURANCE STUDY

COMPLETED ORIGINAL

CHATHAM COUNTY, GEORGIA

UNINCORPORATED AREAS

MAY 19, 1987

Federal Emergency Management Agency

COMMUNITY NUMBER - 130030

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NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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Flood Boundary and Floodway Map

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PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

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FLOOD INSURANCE STUDY

CHATHAM COUNTY,
UNINCORPORATED AREAS,
GEORGIA

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Type 19 Flood Insurance Study is to investigate the existence and severity of flood hazards in the Unincorporated Areas of Chatham County, Georgia, and to aid in the administration of the Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to revise the Flood Insurance Rate Map developed from data presented in the Type 15 Flood Insurance Study. Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain management. Minimum flood plain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the coastal flooding from the Atlantic Ocean were performed by Post, Buckley, Schuh & Jernigan, Inc. (the Study Contractor) for the Federal Emergency Management Agency (FEMA), under Contract No. EMW-C-0947. This study was completed in February 1984. All remaining flooding information was taken from the previous Type 10 and Type 15 Flood Insurance Studies for Chatham County, Unincorporated Areas, Georgia (References 1 and 2).

1.3 Coordination

The initial coordination meeting on June 22, 1982, was attended by representatives of the county, FEMA, and the Study Contractor. The meeting was held to explain the nature and purpose of the study, to outline the scope and limits of the work, as well as to obtain flood information currently available concerning the county.

On November 21, 1985, the results of this Flood Insurance Study were reviewed and accepted at a final coordination meeting attended by representatives of the Study Contractor, FEMA, and the community.

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2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Chatham County, Georgia. The area of study is shown on the Vicinity Map (Figure 1). The incorporated areas within the county were excluded from this study.

Flooding caused by overflow of the following streams was studied in detail:

a. Savannah River, within the county;

b. Ogeechee River, within the county;

c. St. Augustine Creek, from about 0.5 mile upstream of Interstate 95 to about 3.6 miles upstream of Interstate 95;

d. St. Augustine Creek Tributary, from the confluence with St. Augustine Creek to about 4.9 miles upstream of Interstate 95;

e. Salt Creek Tributary, from Interstate 16 to Louisville Road;

f. Pipe Makers Canal, from the confluence with the Savannah River to U.S. Route 80;

g. Hardin Canal, from Interstate 16 to 1.0 mile upstream of Wildcat Dam Road;

h. Dundee Canal, from mouth to about 1.5 miles upstream of Louisville Road;

i. Springfield Canal, within the county;

j. Springfield Canal Tributary A, from just downstream of Seaboard Coast Line Railroad to U.S. Route 17, 1.0 mile upstream of Lynes Parkway;

k. Lower Springfield Canal Tributary, from Seaboard Coast Line Railroad to Garrard Avenue, 1.7 miles upstream of the mouth; and,

l. Casey Canal, within the county.

A detailed coastal flooding analysis was performed on the complete coastline of Chatham County, where the flooding source is the Atlantic Ocean.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards, such as the Little Ogeechee River and streams in the western part of the county.

The areas studied were selected with priority given to all known flood hazard areas and areas of projected development or proposed construction through February 1989. The scope and methods of study were proposed to and agreed upon by FEMA and Chatham County.

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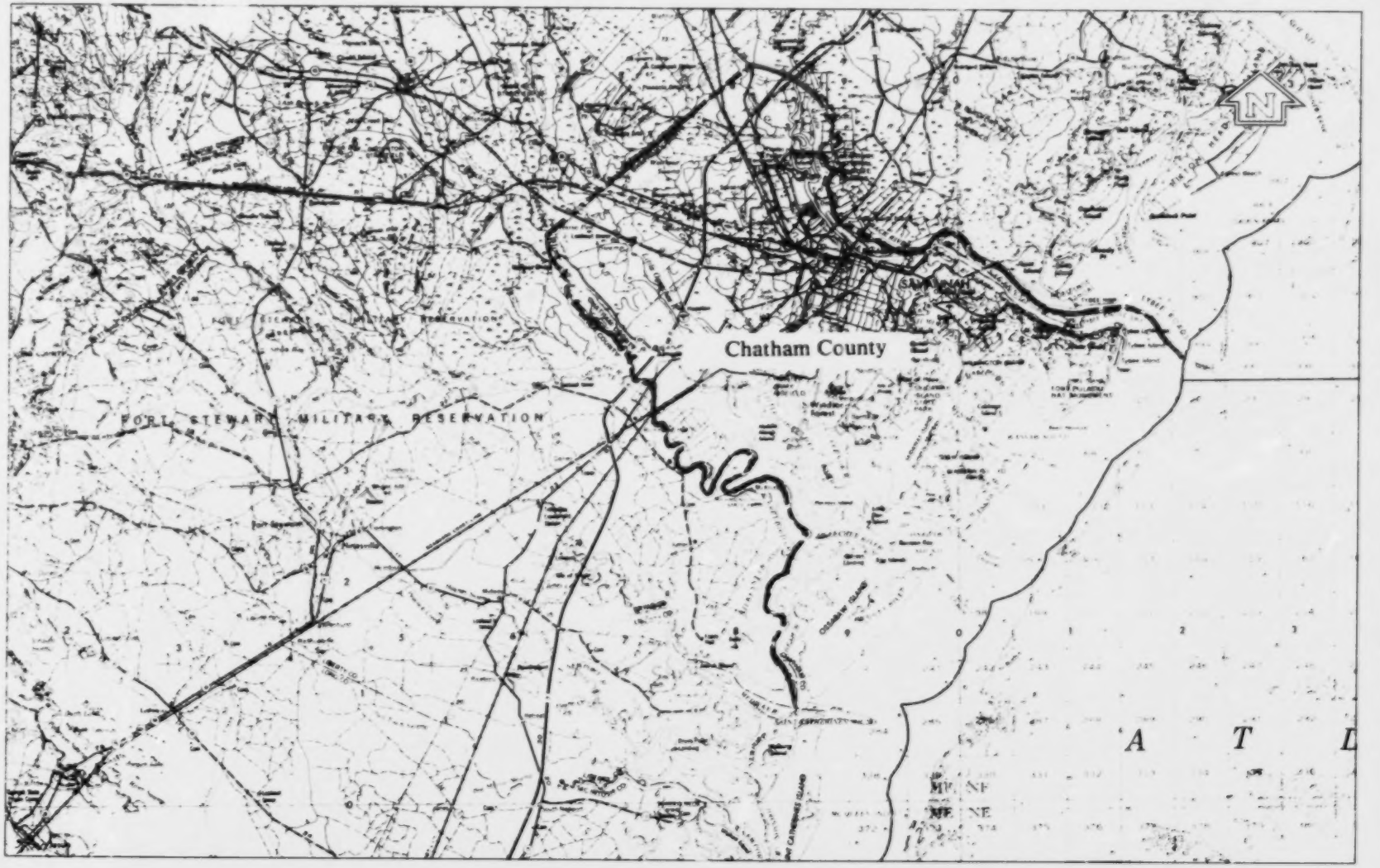

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

APPROXIMATE SCALE

8 0 8 16 24 MILES

VICINITY MAP

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2.2 Community Description

Chatham County, approximately 445 square miles in area, is located in the southeastern portion of Georgia, bordering the Atlantic Ocean. The county is bordered by Bryan County to the southwest across the Ogeechee River; Liberty County to the south across St. Catherines Sound; Effingham County to the northwest; Jasper County, South Carolina, to the northeast across the Savannah River; and, the Atlantic Ocean to the southeast. The Atlantic Ocean coastline accounts for approximately 30 miles of the county's border.

The 1980 population of Chatham County was reported to be 202,226 (Reference 3). Savannah, the county seat and the largest city in the county, had a population of 141,390 in 1980. The county is served by several primary highways and railroads and by one major airport.

The mean temperatures in Chatham County range from a low of 50 degrees Fahrenheit (F.) in January to a high of 75 degrees F. in July. Average annual rainfall is 48 inches, with the summer months receiving the most precipitation. Natural vegetation consists mostly of southern mixed forest made up of pine, gum, oak, and cypress trees (Reference 4).

The county is situated on a low coastal plain with much of its area consisting of tidal marshes and swamps. Elevations range from sea level at the coast to approximately 50 feet in the northwestern portion of the county.

The Savannah River (northern boundary) and the Ogeechee River (southern boundary) have drainage areas extending far beyond the limits of Chatham County. Other streams are chiefly tidal estuaries within the county and include the Little Ogeechee River, Vernon River, Bear River, Wilmington River, Bull River, and numerous tributaries to these. Main openings to the Atlantic Ocean are Ossabaw Sound and Wassaw Sound, both of which are wide and deep.

Much of the land situated in the flood plain is undeveloped marshland, with some residential, commercial, and industrial development.

2.3 Principal Flood Problems

Chatham County is subject to flooding caused by hurricanes and tropical storms. Major storms and hurricanes caused flooding in 1871, 1881, 1885, 1893, 1896, 1898, 1911, 1940, 1944, 1947, 1952, 1959, and 1979 (References 5, 6, and 7). The highest surges occurred during the hurricanes of 1881 and 1893, which caused flood heights up to 16 and 19 feet mean sea level (msl), respectively, in Savannah Beach (References 5 and 6).

The primary factors contributing to flooding in Chatham County are its openness to Atlantic Ocean surges and unfavorable bathymetry extending offshore. Many of the large streams near the coast have wide mouths and are bordered by extensive areas of low marsh. In addition, the terrain at the coast is generally too low to provide an effective barrier. The offshore ocean depths are shallow for great distances, generating a high Atlantic Ocean surge.

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A storm history of Chatham County and its vicinity during the past 100 years is summarized below. Damage figures are determined in dollar values at the time of the storm. No attempt has been made to adjust these figures to current dollar values.

August 16-19, 1871

A tropical cyclone moved overland from Florida and caused damage along the Florida, Georgia, and South Carolina coasts. At Savannah, Georgia, the wind speed was 72 miles per hour (mph) from the north.

August 21-29, 1881

This storm reached hurricane intensity northeast of Puerto Rico on August 22. The lowest barometric pressure reading was 29.08 inches. The storm center entered the coast south of Savannah on August 27. Damage in Savannah was estimated at $1.5 million. Approximately 235 people were killed in and near the city. Nearly 100 vessels were wrecked along the Atlantic coast. Damage was very heavy on Tybee Island and other coastal islands near Savannah. The highest tide observed was estimated to reach an elevation of 16.5 feet msl at Savannah Beach, approximating a flood of at least a 100-year magnitude.

August 21-26, 1885

This storm moved inland north of Savannah on August 25. It caused heavy damage in the Carolinas. Total damage was estimated at about $1.7 million. Damage inflicted by this storm in Georgia was relatively light.

August 15-September 2, 1893

This major hurricane, which originated near the Cape Verde Islands, reached the Georgia coast on August 27. It was accompanied by a tremendous storm wave that submerged the islands along the Georgia and South Carolina coasts. Between 2,000 and 2,500 people lost their lives on the coastal islands and in the lowland between Tybee Island and Charleston. Property damage along the Atlantic coast was estimated at $10 million. Nearly every building on Tybee Island was damaged and the railroad to the island was wrecked. The highest tide known to have occurred in the county was estimated to have a range of 17.0 to 19.5 feet msl at Savannah Beach.

September 22-29, 1896

This hurricane entered the northwestern Florida coast near St. Mark. Its center passed through southeastern Georgia and South Carolina on September 28 and 29. Hurricane winds persisted when the hurricane moved inland. Savannah recorded maximum winds of 75 mph. Damage in Savannah was estimated at $1 million. Damage was also heavy on Tybee Island and over much of southeastern Georgia. Because the damaging hurricane wind was of a short duration near Chatham County and occurred during a low tide period, destruction caused by storm surge was relatively light compared with the hurricanes of 1881 and 1893.

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August 30-September 1, 1898

This hurricane entered the Georgia-South Carolina coast on August 30. Its center passed over Tybee Island. Winds on Tybee Island were estimated at 100 mph. The storm surges were not high enough to cause extensive damage; however, the hurricane was accompanied by very heavy rain, and the countryside was flooded for 100 miles around Savannah. Most roads and railroads were impassable because of high water.

August 23-30, 1911

The center of this hurricane entered the coast between Savannah and Charleston on August 28. A maximum wind of 88 mph from the northwest was recorded at Savannah. Damage in the Savannah area was remarkably low; however, property on Tybee Island was heavily damaged. Excessive rains accompanied the storm and caused considerable damage to roads, crops, and other property throughout southern Georgia.

August 5-15, 1940

This was the first hurricane to affect Georgia since August 1911. Its center entered the South Carolina coast to the north of Savannah on August 11. The wind at Savannah reached 73 mph, and damage in the Savannah area was estimated at $850,000. The highest tide observed at Beaufort, South Carolina, was estimated to be 12.4 feet msl. High tides of 7.4 and 6.4 feet msl were recorded at Fort Pulaski, Georgia, and at Fort Jackson, Savannah Harbor, Georgia, respectively.

October 12-23, 1944

This hurricane entered the gulf coast of Florida and moved northeastward across the peninsula. Its center crossed the east coast near Jacksonville, Florida, in a north-northeast direction and moved inland again near Savannah. The hurricane was downgraded to a tropical storm by the time it reached Georgia. The highest tide, 5.9 feet msl along the Georgia coast, was observed at Fort Pulaski, near the mouth of the Savannah River. The estimated damage in Georgia was $500,000.

October 9-16, 1947

The center of this hurricane entered the Georgia coast just south of Savannah on October 15. At Savannah, the maximum wind speed was 77 mph, and the lowest barometric pressure was 28.77 inches. Heavy losses were sustained at Savannah and Savannah Beach, where more than 1,500 buildings were substantially damaged. Total damage in the coastal area was estimated at more than $2 million. The highest tide, 7.9 feet msl, was recorded at Fort Jackson.

August 18-September 2, 1952 (Hurricane Able)

Hurricane Able moved inland on August 30. Its center passed near Beaufort with maximum winds of approximately 100 mph. Damage from this storm was estimated at about $2.8 million.

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September 20-October 2, 1959 (Hurricane Gracie)

Hurricane Gracie moved inland on September 29. Its center passed over the South Carolina coast near Beaufort. Wind gusts of hurricane force were felt in the Savannah area, and damage was inflicted over the upper Georgia coastal area. The total damage inflicted by the storm was estimated at $14 million with damage in Georgia estimated at more than $500,000. Highwater marks, which were reported near Edisto Beach, South Carolina, ranged from 7.5 to 11.9 feet msl.

August 25-September 7, 1979 (Hurricane David)

Hurricane David was the most intense storm of the century to affect the islands of the eastern Carribean. However, the storm was not a major hurricane when it struck the United States. David struck just north of Palm Beach, Florida on September 3 and made a second landfall about 24 hours later near Savannah Beach, Georgia. In the United States, David was responsible for five deaths and about $300 million in damages. The death toll and damage were much greater in Dominica, Cuba, and the Dominican Republic (Reference 7).

2.4 Flood Protection Measures

Some inland drainage has been improved. The seawall at Savannah Beach provides some protection from waves and flooding.

Levees exist in the study area that provide the community with some degree of protection against flooding. However, it has been ascertained that some of these levees may not protect the community from rare events such as the 100-year flood. The criteria used to evaluate protection against the 100-year flood are 1) adequate design, including freeboard, 2) structural stability, and 3) proper operation and maintenance. Levees that do not protect against the 100-year flood are not considered in the hydraulic analysis of the 100-year flood plain.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

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3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each riverine flooding source studied in detail affecting the community. Analyses were also carried out to establish the peak elevation-frequency relationships for each coastal flooding source studied in detail.

The hydrologic analysis for Casey Canal was obtained from the Flood Insurance Study for the City of Savannah, Chatham County, Georgia (Reference 8).

Peak discharges for riverine flooding sources were obtained from Flood Plain Information Reports (References 9 and 10).

Peak discharges for the 100-year flood for three of the riverine flooding sources studied in detail in the community are shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK DISCHARGE (CFS) 100-YEAR
PIPE MAKERS CANAL		
at mouth	23.8	3,420
at Dean Forest Road	16.2	2,690
at Interstate 95	9.6	1,880
DUNDEE CANAL		
at mouth	5.5	1,175
at U.S. Route 80	2.3	700
at Seaboard Coast Line Railroad about 2,000 feet upstream of Louisville Road	1.3	490
SALT CREEK TRIBUTARY		
at Interstate 16	6.4	720

Inundation from the Atlantic Ocean caused by passage of storms (storm surge) was determined by the joint probability method (Reference 11). The storm populations were described by probability distributions of 5 parameters that influence surge heights. These parameters were central pressure depression (which measures the intensity of the storm), radius to maximum winds, forward speed of the storm, shoreline crossing point, and crossing angle. These characteristics were described statistically based on an analysis of observed storms in the vicinity of Chatham County. Primary sources of data for this were "Tropical Cyclone Card Deck 993" (Reference 12), "Tropical Cyclones of the North Atlantic Ocean, 1871-1980" (Reference 13), "Tropical Cyclones of the North Atlantic Ocean" (Reference 14), and "Some Climatological Characteristics of Hurricanes and Tropical Storms, Gulf and East Coasts of the United States" (Reference 15). A summary of the parameters used for the area is presented in Table 2, Parameter Values for Surge Elevations.

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CENTRAL PRESSURE DEPRESSION (MILLIBARS)	83	67	53	42	33	23	9
ASSIGNED PROBABILITIES[1]	0.03	0.08	0.11	0.13	0.16	0.29	0.20
STORM RADIUS TO MAXIMUM WINDS (NAUTICAL MILES)	12			20			28
PROBABILITY[1]	0.24			0.26			0.50
FORWARD SPEED (KNOTS)	7			11			15
PROBABILITIES:[1]	0.45			0.30			0.25
DIRECTION OF STORM PATH[1] (DEGREES FROM TRUE NORTH)			327		301		
PROBABILITY[1]			0.51		0.49		
FREQUENCY OF STORM OCCURRENCE (STORM/NAUTICAL MILE/YEAR)	65[2] 0.00107		20[2] 0.0012		25[3] 0.00124		70[3] 0.00131

[1]AVERAGE OF DIFFERENT STORM TRACK LOCATIONS
[2]NAUTICAL MILES SOUTH OF GEORGIA SOUTH CAROLINA BOUNDARY
[3]NAUTICAL MILES NORTH OF GEORGIA SOUTH CAROLINA BOUNDARY

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA
(UNINCORPORATED AREAS)

PARAMETER VALUES FOR SURGE ELEVATIONS
(ENTERING HURRICANES)

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CENTRAL PRESSURE DEPRESSION (MILLIBARS)	83	67	53	42	33	23	9
ASSIGNED PROBABILITIES[1]	0.03	0.08	0.11	0.13	0.16	0.29	0.20
STORM RADIUS TO MAXIMUM WINDS (NAUTICAL MILES)	12			20			28
PROBABILITY[1]	0.24			0.26			0.50
FORWARD SPEED (KNOTS)	7			11			15
PROBABILITIES:[1]	0.32			0.30			0.38
DIRECTION OF STORM PATH[1] (DEGREES FROM TRUE NORTH)				35			
PROBABILITY				1.0			
FREQUENCY OF STORM OCCURRENCE (STORM/NAUTICAL MILE/YEAR)	65[2] 0.0039[4] 0.0042[5]		20[2] 0.0045[4] 0.0048[5]		25[3] 0.0051[4] 0.0054[5]		70[3] 0.0058[4] 0.0061[5]

[1]AVERAGE OF DIFFERENT STORM TRACK LOCATIONS
[2]NAUTICAL MILES SOUTH OF GEORGIA-SOUTH CAROLINA BOUNDARY
[3]NAUTICAL MILES NORTH OF GEORGIA-SOUTH CAROLINA BOUNDARY
[4]15 NAUTICAL MILES OFFSHORE
[5]45 NAUTICAL MILES OFFHSORE

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA
(UNINCORPORATED AREAS)

PARAMETER VALUES FOR SURGE ELEVATIONS
(ALONGSHORE HURRICANES)

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CENTRAL PRESSURE DEPRESSION (MILLIBARS)	83	67	53	42	33	23	9
ASSIGNED PROBABILITIES[1]	0.03	0.08	0.11	0.13	0.16	0.29	0.20
STORM RADIUS TO MAXIMUM WINDS (NAUTICAL MILES)	12			20			28
PROBABILITY[1]	0.24			0.26			0.50
FORWARD SPEED (KNOTS)	7						13
PROBABILITIES:[1]	0.45						0.55
DIRECTION OF STORM PATH[1] (DEGREES FROM TRUE NORTH)			54		94		
PROBABILITY[1]			0.75		0.25		
FREQUENCY OF STORM OCCURRENCE (STORM/NAUTICAL MILE/YEAR)	65[2] 0.0026		20[2] 0.0013		25[3] 0.00069		70[3] 0.00056

[1]AVERAGE OF DIFFERENT STORM TRACK LOCATIONS
[2]NAUTICAL MILES SOUTH OF GEORGIA-SOUTH CAROLINA BOUNDARY
[3]NAUTICAL MILES NORTH OF GEORGIA-SOUTH CAROLINA BOUNDARY

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA
(UNINCORPORATED AREAS)

PARAMETER VALUES FOR SURGE ELEVATIONS
(EXITING HURRICANES)

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For areas subject to flooding directly from the Atlantic Ocean, the FEMA standard storm surge model was used to simulate the coastal surge generated by any chosen storm (that is, any combination of the 5 storm parameters defined previously). By performing such simulations for a large number of storms, each of known total probability, the frequency distribution of surge height can be established as a function of coastal location. These distributions incorporate the large-scale surge behavior, but do not include an analysis of the added effects associated with much finer scale wave phenomena, such as wave height or runup. As the final step in the calculations, the astronomic tide for the region is then statistically combined with the computed storm surge to yield recurrence intervals of total water level (Reference 16).

The storm-surge elevations for the 10-, 50-, 100-, and 500-year floods have been determined for Chatham County and are shown in Table 3, Summary of Stillwater Elevations. The analyses reported herein reflect the stillwater elevations due to tidal and wind setup effects and include the contributions from wave action effects.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the riverine sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals.

Water-surface profiles for St. Augustine Creek, St. Augustine Creek Tributary, Hardin Canal, Springfield Canal, and Springfield Canal Tributary A, were taken from the Type 10 Flood Insurance Study performed for Chatham County (Reference 1).

Water-surface profiles for Pipe Makers Canal, Salt Creek Tributary, Dundee Canal, and Lower Springfield Canal Tributary were taken from Flood Plain Information Reports (References 11, 12, and 17). Detailed information for the Ogeechee River was provided by the U.S. Army Corps of Engineers (COE) in Savannah.

Elevations for the Savannah River (including a portion of Black Creek) were obtained from a map provided by the U.S. Army Corps of Engineers (COE), showing 100-year elevations (Reference 18).

The hydraulic analysis for Casey Canal was obtained from the Flood Insurance Study for the City of Savannah (Reference 8).

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles. For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Boundary and Floodway Map.

Flood profiles were drawn showing the computed water-surface elevations for floods of the selected recurrence intervals. In cases where the 50- and 100-year flood elevations are close together, due to limitations of the profile scale, only the 100-year profile has been drawn.

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FLOODING SOURCE AND TRANSECT	FLOODING INSURANCE RATE MAP PANEL	STILLWATER ELEVATION (FEET NGVD)				ZONE	BASE FLOOD ELEVATION[1,2] (FEET NGVD)
		10-YEAR	50-YEAR	100-YEAR	500-YEAR		
ATLANTIC OCEAN							
1-10	0075,0090,0135,0145	9.6	11.6	13.0	14.2	VE	15-20
	0155,0160,0165,0170					AE	13-15
	0205,0210,0215,0220	10.2	11.9	12.0	14.4	VE	14-17
						AE	12-14
1-8	0075,0135,0145,0155	10.5	12.5	13.0	15.4	VE	15-20
	0165,0170,0205,0210					AE	13-15
	0215,0220	10.2	11.9	12.0	14.4	VE	14-17
						AE	12-14
1-9	0075,0135,0145,0155	10.4	12.2	13.0	14.9	VE	15-20
	0165,0170,0205,0210					AE	13-15
	0215,0220	10.2	11.9	12.0	14.4	VE	14-17
						AE	12-14
8-10	0075,0090,0135,0145	10.4	12.2	13.0	14.9	VE	15-20
	0155,0165,0170,0210					AE	13-15
		10.6	12.7	14.0	15.4	VE	16-18
		10.2	11.9	12.0	14.4	VE	14-15
						AE	12-14
6-10	0075,0090,0135,0145	10.4	12.2	13.0	14.9	VE	15-20
	0155,0165,0175,0205	10.6	12.7	14.0	15.4	VE	16-18
	0210	10.2	11.9	12.0	14.4	VE	14
						AE	12-14

[1]ROUNDED TO THE NEAREST FOOT AND MAY INCLUDE EFFECTS OF WAVE ACTION
[2]DUE TO MAP SCALE LIMITATIONS, BASE FLOOD ELEVATIONS SHOWN ON MAP MAY REPRESENT AVERAGE ELEVATIONS FOR THE ZONES DEPICTED

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA
(UNINCORPORATED AREAS)

SUMMARY OF STILLWATER ELEVATIONS

ATLANTIC OCEAN

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FLOODING SOURCE AND TRANSECT	FLOODING INSURANCE RATE MAP PANEL	STILLWATER ELEVATION (FEET NGVD)				ZONE	BASE FLOOD ELEVATION[1,2] (FEET NGVD)
		10-YEAR	50-YEAR	100-YEAR	500-YEAR		
ATLANTIC OCEAN							
3-13	0075,0090,0095,0135 0145,0155,0160,0170 0190,0210	10.4	12.2	13.0	14.9	VE	15-20
						AE	15
		10.6	12.7	14.0	15.4	VE	16-18
		10.3	11.8	12.0	13.6	VE	14
						AE	12-14
11-16	0095,0160,0170,0180 0190	9.7	11.7	13.0	14.5	VE	15-20
						AE	13-15
		10.3	11.8	12.0	13.6	VE	14
						AE	12-14
14-17	0095,0115,0160,0180 0190	10.1	12.2	13.0	14.8	VE	15-20
						AE	13-15
		11.1	13.3	14.0	16.1	VE	16-18
		9.2	11.1	12.0	14.1	VE	14-15
						AE	12-14
13-16	0095,0160,0170,0180 0190	10.1	12.2	13.0	14.8	VE	15-20
						AE	13-15
		11.1	13.3	14.0	16.1	VE	16-18
		9.2	11.1	12.0	14.1	VE	14-15
						AE	12-14
17-20	0085,0095,0105,0115 0120,0160,0180,0185	10.1	12.2	13.0	14.8	VE	15-20
						AE	13-15
		11.4	13.3	14.0	15.6	VE	16-18
						AE	14-16
		9.2	11.1	12.0	14.1	VE	15-17
						AE	12-14

[1]ROUNDED TO THE NEAREST FOOT AND MAY INCLUDE EFFECTS OF WAVE ACTION
[2]DUE TO MAP SCALE LIMITATIONS, BASE FLOOD ELEVATIONS SHOWN ON MAP MAY REPRESENT AVERAGE ELEVATIONS FOR THE ZONES DEPICTED

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA
(UNINCORPORATED AREAS)

SUMMARY OF STILLWATER ELEVATIONS

ATLANTIC OCEAN

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FLOODING SOURCE AND TRANSECT	FLOODING INSURANCE RATE MAP PANEL	STILLWATER ELEVATION (FEET NGVD)				ZONE	BASE FLOOD ELEVATION[1,2] (FEET NGVD)
		10-YEAR	50-YEAR	100-YEAR	500-YEAR		
ATLANTIC OCEAN							
17-24	0085,0095,0105,0110 0115,0120,0160,0180 0185	10.1	12.2	13.0	14.8	VE	15-20
						AE	13-15
		11.4	13.3	14.0	15.6	VE	16-18
						AE	14-16
		9.2	11.1	12.0	14.1	VE	15-17
						AE	12-14
19-24	0085,0095,0105,0110 0115,0120,0180,0185	10.3	12.5	13.0	15.5	VE	15-20
						AE	14-15
		11.4	13.3	14.0	15.6	VE	17-19
		9.2	11.1	12.0	14.1	VE	14-16
						AE	14
21-24	0085,0105,0110,0115 0120,0185	10.3	12.5	13.0	15.5	VE	15-20
						AE	14-15
		11.4	13.3	14.0	15.6	VE	17-19
		9.2	11.1	12.0	14.1	VE	14-16
						AE	14
N/A	0030,0040,0080,0085	10.0	11.3	12.0	13.5	AE	12
N/A	0040	8.9	10.3	10.8	12.3	AE	11
N/A	0075,0080,0090	10.3	11.8	12.4	13.6	AE	12

[1]ROUNDED TO THE NEAREST FOOT AND MAY INCLUDE EFFECTS OF WAVE ACTION
[2]DUE TO MAP SCALE LIMITATIONS, BASE FLOOD ELEVATIONS SHOWN ON MAP MAY REPRESENT AVERAGE ELEVATIONS FOR THE ZONES DEPICTED

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA
(UNINCORPORATED AREAS)

SUMMARY OF STILLWATER ELEVATIONS

ATLANTIC OCEAN

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The hydraulic analyses for the riverine study are based only on the effects of unobstructed flow. The flood elevations shown on the profiles are, thus, considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

Hydraulic analyses, considering storm characteristics and the shoreline and bathymetric characteristics of the flooding sources studied, were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of the shorelines.

All dunes and structures were assumed to remain intact for purposes of this analysis. The FEMA storm surge model was utilized to simulate the hydrodynamic behavior of the surge generated by the various synthetic storms. This model utilizes a grid pattern approximating the geographical features of the study area and the adjoining areas. Surges were computed utilizing grids of 8 by 5 nautical miles and 6,000 feet by 6,000 feet, depending on the resolution required.

Underwater depths and land heights for the model grid systems were obtained from National Oceanic and Atmospheric Administration nautical charts, U.S. Geological topographic maps, and aerial photogrammetry and field surveys conducted as part of this study (References 19, 20, 21, and 22).

The methodology for analyzing the effects of wave heights associated with coastal storm surge flooding is described in a report prepared by the National Academy of Sciences (Reference 23). This method is based on the following major concepts. First, depth-limited waves in shallow water reach a maximum breaking height that is equal to 0.78 times the stillwater depth. The wave crest is 70 percent of the total wave height above the stillwater level. The second major concept is that wave height may be diminished by dissipation of energy due to the presence of obstructions, such as sand dunes, dikes and seawalls, buildings, and vegetation. The amount of energy dissipation is a function of the physical characteristics of the obstruction and is determined by procedures prescribed in References 23 and 24. The third major concept is that wave height can be regenerated in open fetch areas due to the transfer of wind energy to the water. This added energy is related to fetch length and depth.

Wave heights were computed along transects (cross-section lines) that were located along the coastal areas, as illustrated in Figure 2, Transect Location Map, in accordance with the "Users Manual for Wave Height Analysis" (Reference 25). The transects were located with consideration given to the physical and cultural characteristics of the land so that they would closely represent conditions in their locality. Transects were spaced close together in areas of complex topography and dense development. In areas having more uniform characteristics, they were spaced at large intervals. It was also necessary to locate transects in areas where unique flooding existed and in areas where computed wave heights varied significantly between adjacent transects.

Each transect was taken perpendicular to the shoreline and extended inland to a point where wave action ceased. Along each transect, wave heights and elevations were computed considering the combined effects of changes in ground elevation, vegetation, and physical features. The stillwater

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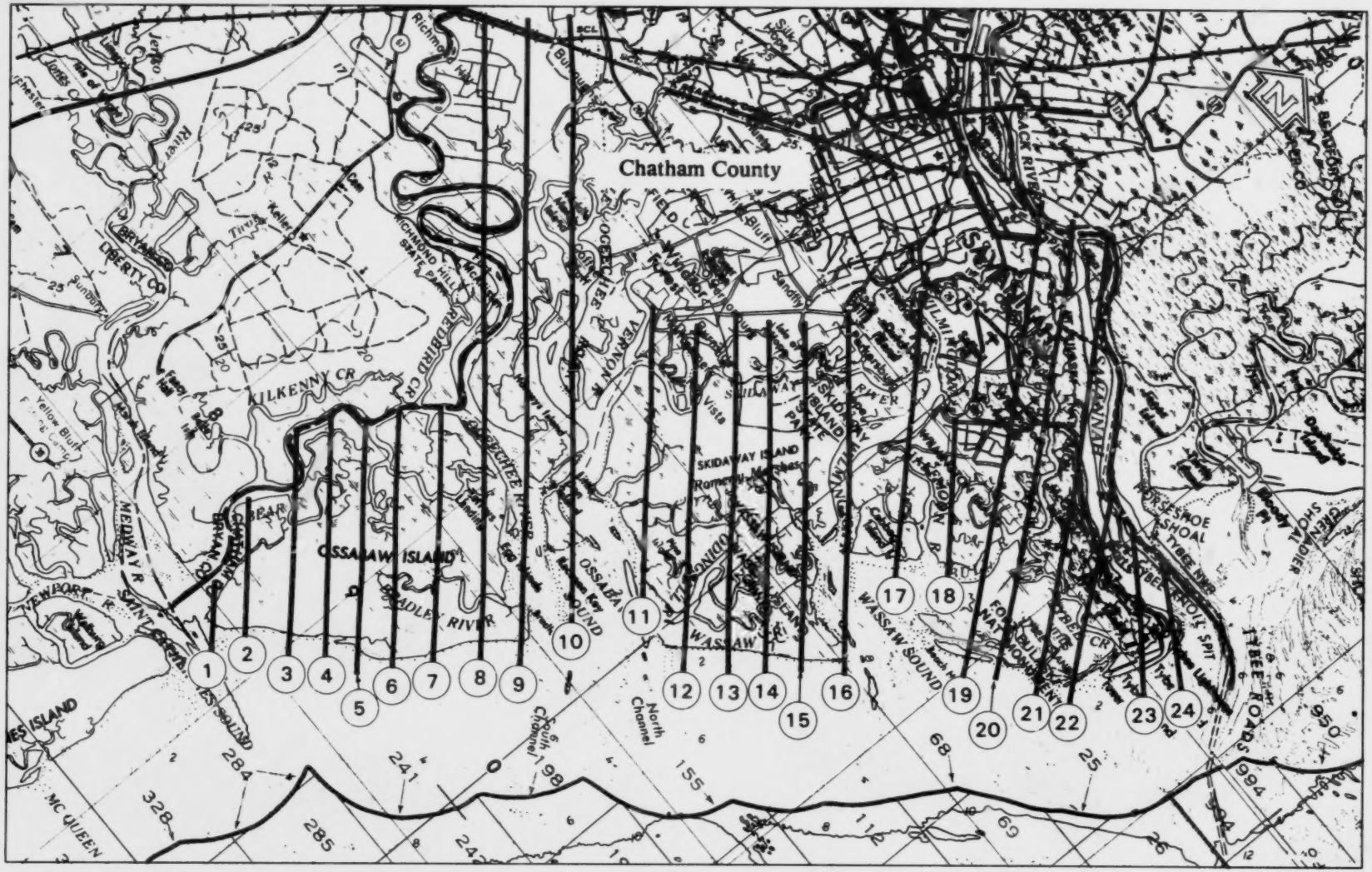

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

APPROXIMATE SCALE

4 0 4 8 12 MILES

TRANSECT LOCATION MAP

FIGURE 2

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elevations for the 100-year flood were used as the starting elevations for these computations. Wave heights were calculated to the nearest 0.1 foot, and wave elevations were determined at whole-foot increments along the transects. The location of the 3-foot breaking wave for determining the terminus of the V zone (area with velocity wave action) was also computed at each transect. Table 4 provides a listing of the transect locations and stillwater starting elevations, as well as initial wave crest elevations.

Figure 3 represents a sample transect that illustrates the relationship between the stillwater elevation, the wave crest elevation, the ground elevation profile, and the location of the A/V zone boundary.

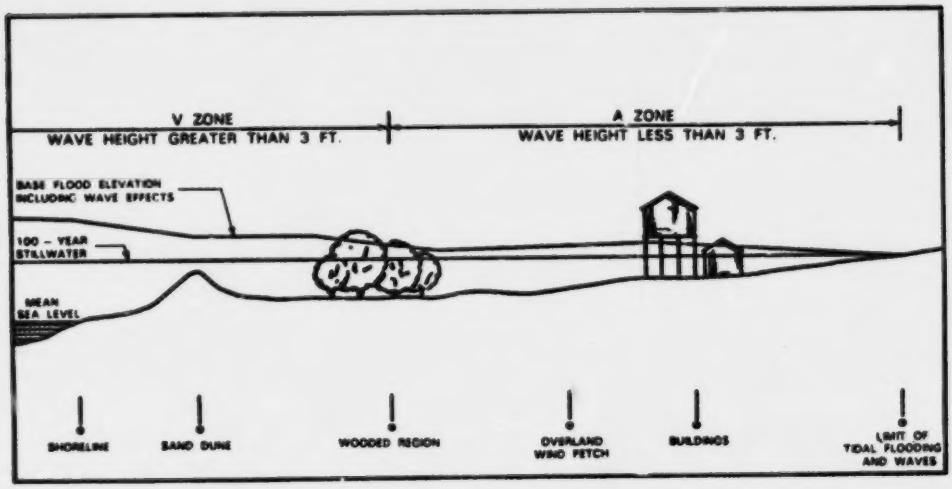

FIGURE 3 - Transect Schematic

After analyzing wave heights along each transect, wave elevations were interpolated between transects. Various source data were used in the interpolation, including topographic maps (Reference 21), aerial photographs (Reference 22), and engineering judgment. Controlling features affecting the elevations were identified and considered in relation to their positions at a particular transect and their variation between transects.

All elevations are referenced to the National Geodetic Vertical Datum of 1929. Elevation reference marks used in this study are shown on the maps and described in the exhibit labeled Elevation Reference Marks.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study produces maps designed to assist communities in developing flood plain management measures.

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TABLE 4 - TRANSECT LOCATIONS, STILLWATER STARTING ELEVATIONS, AND INITIAL WAVE CREST ELEVATIONS

Transect	Location	Elevation (Feet) Stillwater	Wave Crest
1	across Ossabaw Island approximately 1 mile northeast of the intersection between Bryan, Chatham, and Liberty Counties boundary line	13.0	20.1
2	across Ossabaw Island approximately 1 mile east of the mouth of the Bear River	13.0	20.1
3	across Ossabaw Island approximately 2 miles east of the mouth of the Bear River	13.0	20.1
4	across Ossabaw Island approximately 1 mile southwest of Pelican Point	13.0	20.1
5	across Ossabaw Island approximately 1,000 feet southwest of Pelican Point	13.0	20.1
6	across Ossabaw Island approximately 1 mile northeast of Pelican Point	13.0	20.1
7	across Ossabaw Island approximately 2 miles northeast of Pelican Point	13.0	20.1
8	across Ossabaw Island approximately 2 miles southwest of Bradley Point	13.0	20.1
9	across Ossabaw Island approximately 1,000 feet southwest of Bradley Point	13.0	20.1
10	across Raccoon Key and continues up to approximately 1 mile south of the Seaboard Coast Line	13.0	20.1
11	across the western side of Wassaw Island, continuing through the western portion of Skidaway Island	13.0	20.1
12	across Wassaw Island approximately 0.5 mile southeast of the mouth of the Odingsell River, continuing through Skidaway Island	13.0	20.1

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TABLE 4 - TRANSECT LOCATIONS, STILLWATER STARTING ELEVATIONS, AND INITIAL WAVE CREST ELEVATIONS
(Continued)

Transect	Location	Elevation (Feet) Stillwater	Wave Crest
13	across Wassaw Island approximately 1.5 miles southeast of the mouth of the Odingsell River, continuing through Skidaway Island	13.0	20.1
14	across Wassaw Island approximately 2.5 miles southeast of the mouth of the Odingsell River, continuing through Skidaway Island	13.0	20.1
15	across Wassaw Island approximately 3 miles south of the mouth of the Wilmington River, continuing through Skidaway Island	13.0	20.1
16	across the eastern portion of Wassaw Island approximately 3 miles southeast of the mouth of the Wilmington River	13.0	20.1
17	across Cabbage Island approximately 1 mile east of the mouth of the Wilmington River	13.0	20.1
18	across the western portion of Petit Chou Island approximately 1 mile southeast of the mouth of the Tybee River	13.0	20.1
19	across Tybee Island approximately 2 miles southeast of the mouth of the Bull River	13.0	20.1
20	across Tybee Island approximately 2.3 miles southeast of the mouth of the Bull River	13.0	20.1
21	across Tybee Island approximately 2 miles southwest of the mouth of Tybee Creek	13.0	20.1
22	across Tybee Island approximately 0.8 mile southwest of the mouth of Tybee Creek	13.0	20.1
23	across Tybee Island approximately 0.5 mile east of the mouth of Tybee Creek	13.0	20.1
24	across the eastern portion of Tybee Island approximately 1 mile southeast of the Tybee Island Lighthouse	13.0	20.1

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4.1 Flood Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for flood plain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the 100- and 500-year flood plain boundaries have been delineated using the Type 15 Flood Insurance Study for Chatham County, Unincorporated Areas, Georgia (Reference 2). For each coastal flooding source studied in detail, the 100- and 500-year flood plain boundaries have been delineated using the flood elevations determined at each transect. Between transects, the boundaries were interpolated using topographic maps at a scale of 1:24000, with a contour interval of 5 feet (Reference 21).

For the streams studied by approximate methods, only the 100-year flood plain boundary was delineated using the Type 15 Flood Insurance Study for Chatham County and Flood Hazard Boundary Map for Chatham County (References 2 and 25).

The 100- and 500-year flood plain boundaries are shown on the Flood Boundary and Floodway Map. In cases where the 100- and 500-year flood plain boundaries are close together, only the 100-year flood plain boundary has been shown. Small areas within the flood plain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

4.2 Floodways

Encroachment on flood plains, such as structures and fill, reduces the flood-carrying capacity, increases the flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood plain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations were tabulated at selected cross sections for each stream segment for which a floodway was computed and are presented in Table 5, Floodway Data.

As shown on the Flood Boundary and Floodway Map, the floodway boundaries were computed at cross sections. Between cross sections, the boundaries were interpolated. In cases where the floodway and the 100-year flood plain boundaries are either close together or collinear, only the floodway boundary has been shown.

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
PIPE MAKERS CANAL								
A	36,537	512[2]	2911	0.8	15.4	15.4	16.4	1.0
B	41,995	469	2181	0.9	16.1	16.1	17.1	1.0
C	46,088	437[3]	1898	1.0	17.0	17.0	17.9	0.9
D	56,641	279[3]	1490	0.7	18.9	18.9	19.9	1.0
E	62,421	631[3]	2923	0.4	19.3	19.3	20.3	1.0
F	64,901	165[3]	574	1.2	19.4	19.4	20.4	1.0
G	65,060	237[3]	804	0.9	19.8	19.8	20.7	0.9
H	67,000	450[3]	1328	0.5	20.0	20.0	20.9	0.9

[1]FEET ABOVE CONFLUENCE WITH SAVANNAH RIVER
[2]THIS WIDTH IS WITHIN INCORPORATED AREAS
[3]THIS WIDTH EXTENDS WITHIN INCORPORATED AREAS

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA
(UNINCORPORATED AREAS)

FLOODWAY DATA

PIPE MAKERS CANAL

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The area between the floodway and the 100-year flood plain boundaries is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 4.

The floodway for Pipe Makers Canal was taken from the Flood Insurance Studies for the Town of Pooler and the City of Bloomingdale, Chatham County, Georgia (References 26 and 27). Portions of the floodway of Pipe Makers Canal lie within areas not included.

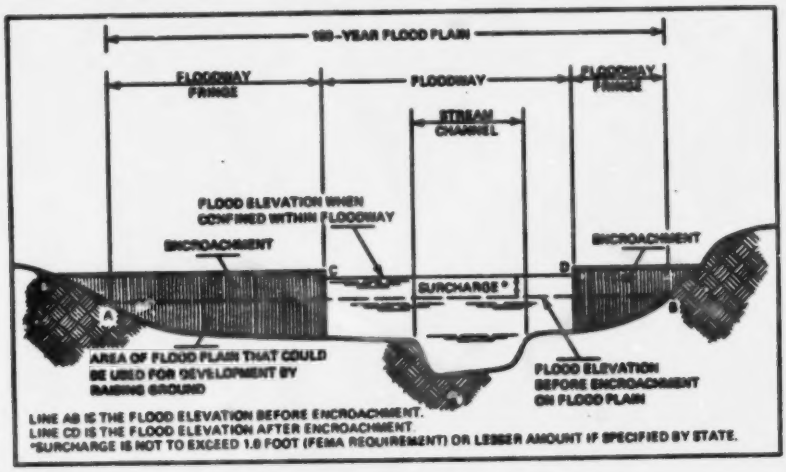
100-YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE *
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT.
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT.
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FIGURE 4 - Floodway Schematic

The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year flood plains that are determined in the Flood Insurance Study by detailed methods. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

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Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal flood plains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year flood plain, areas within the 500-year flood plain, areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and flood plain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year flood plains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For flood plain management applications, the map shows by tints, screens, and symbols the 100- and 500-year flood plains, the floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

7.0 OTHER STUDIES

This Flood Insurance Study matches the Flood Insurance Studies for the Town of Pooler, the City of Bloomingdale, and Bryan and Liberty Counties, Unincorporated Areas, Georgia (References 26-29).

In addition, this Flood Insurance Study agrees with the Flood Insurance Studies in progress for the Cities of Savannah, Port Wentworth, and Tybee Island, the Town of Vernonburg, and Town of Thunderbolt (References 8 and 30-33).

This Flood Insurance Study supersedes other previously published studies that have been conducted by several agencies for the entire coast of Georgia. In 1959, the U.S. Weather Bureau and the COE published a study of meteorological characteristics of hurricanes along the Atlantic and Gulf coasts of the United States (Reference 34).

Due to its more detailed and up-to-date analysis, this Flood Insurance Study supersedes the previously published Type 10 and Type 15 Flood Insurance Studies for Chatham County, Unincorporated Areas, Georgia (References 1 and 2).

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8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, Federal Emergency Management Agency, 1371 Peachtree Street, N.E., Suite 736, Atlanta, Georgia 30309.

9.0 REFERENCES AND BIBLIOGRAPHY

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32. _____, Flood Insurance Study, Town of Vernonburg, Chatham County, Georgia, in progress.

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ELEVATION REFERENCE MARKS

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
1	0025	15.68	U.S. Coast and Geodetic Survey disk at the crossing of State Route 30 and Seaboard Coast Line Railroad, 60 feet east of center of crossing of main track and highway, 1 foot below level of track
2	0020	19.48	U.S. Coast and Geodetic Survey disk located 1.35 miles west along the Seaboard Coast Line Railroad from Pooler Road, about 975 feet east of dirt road crossing, 4 feet south of south rail
3	0020	20.21	U.S. Coast and Geodetic Survey disk located about 0.2 mile east along Seaboard Coast Line Railroad from Pooler Road, 55 feet north of north rail
4	0040	12.80	U.S. Army Corps of Engineers disk set level with a concrete ramp leading to loading dock located at entrance gate to Savannah Sugar Refinery, about 1,300 feet west of confluence of the Front River and the Middle River
5	0075	17.16	U.S. Coast and Geodetic Survey disk located 2 miles east along the Seaboard Coast Line Railroad from Pooler Road, 40.5 feet north of north rail, 4 feet below level of track
6	0075	14.40	nail 3 feet above ground in power pole, located 1.1 miles southwest along Seaboard Coast Line Railroad tracks from Cheves Road, third pole northeast of milepost 504.20 feet southeast of southeast rail
7	0075	19.12	nail in power pole located on southeast side of Seaboard Coast Line Railroad track, 0.6 mile northeast from Cheves Road, fourth pole southwest from milepost 302
8	0075	19.27	brass disk on raised walkway at southeast corner of U.S. Route 17 bridge over the Ogeechee River
9	0075	17.27	chiseled square in southwest corner of headwall located on northwest side of U.S. Route 17, about 1.5 miles northeast of north end of U.S. Route 17 bridge over the Ogeechee River, 27 feet northwest of centerline of road

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ELEVATION REFERENCE MARKS (Continued)

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
10	0080	17.47	U.S. Coast and Geodetic Survey disk located at intersection of Seaboard Coast Line Railroad and Dean Forest Road, 47 feet south of south rail, 1 foot above level of track
11	0080	10.67	U.S. Coast and Geodetic Survey disk located about 0.6 mile east of crossing of Dean Forest Road and Seaboard Coast Line Railroad, 46 feet south of south rail, 5 feet below level of track
12	0085	13.05	chiseled square in top of west end of headwall on north side of Saffold Drive, 20.8 feet south of south edge of pavement of Island Expressway
13	0085	23.60	standard disk set in top of east corner of concrete structure with two manhole covers located 20 feet northwest of centerline of President Street Extension about 0.65 mile east of intersection with Pennsylvania Avenue
14	0085	32.17	chiseled square 6 inches west of east end of bridge in raised walkway on south side of Island Expressway bridge over the Wilmington River
15	0085	16.80	chiseled square 6 inches west of east end of bridge in raised walkway on the south side of Island Expressway bridge over Richardson Creek
16	0085	14.38	brass disk attached to steel rod located inside of 6 inch PVC pipe, 150 feet south of center of Saffold Drive (at treeline), 100 feet west of Johny Mercer Drive, 5 feet west of billboard
17	0090	27.85	chiseled square in west end of north wheel guard of State Route 204 bridge over the Little Ogeechee River
18	0090	17.11	chiseled square in top of lane divider, 1.05 miles west of west end of State Route 204 bridge over the Little Ogeechee River
19	0135	16.80	U.S. Coast and Geodetic Survey disk set in top of northwest and of southwest concrete abutment of Seaboard Coast Line Railroad bridge over the Ogeechee River

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ELEVATION REFERENCE MARKS (Continued)

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
20	0095	14.49	U.S. Coast and Geodetic Survey disk set in top of concrete post projecting 2 inches, located 3.5 feet northeast of northwest corner of concrete block pillar of shelter for bench, 52.5 feet north-northeast of centerline of Johny Mercer Drive, 27 feet west-northwest of centerline of entrance drive of Saffold Field
21	0095	12.73	U.S. Coast and Geodetic Survey disk set in top of concrete post projecting 2 inches, located 28 feet northeast of centerline of Johny Mercer Drive, 149 feet southeast of center of intersection of Bradley Point Tuad, 4.5 feet north of power pole with branch line leading south
22	0095	11.05	nail in power pole located at southeast corner of intersection of Wilmington Island Road and Winchester Drive
23	0105	15.23	brass disk set 3 feet west of east end of bridge in top of raised walkway on north side of U.S. Route 80 bridge over the Bull River
24	0115	13.30	bolt set in raised walkway 3 feet east of west end of bridge along south side of U.S. Route 80 bridge over Turners Creek
25	0115	7.40	U.S. Coast and Geodetic Survey disk set in top of northeast end of concrete pier under southeast end of draw span of U.S. Route 80 bridge over Turners Creek, about 5.5 feet below level of bridge floor
26	0115	14.17	nail set in south side of power pole located 40 feet north of center of Island Expressway, 40 feet west of center of Quaterman Drive
27	0115	17.71	U.S. Coast and Geodetic Survey disk located about 1 mile east along U.S. Route 80 from bridge over Turners Creek, set level with highway
28	0115	27.43	brass disk set in concrete at southeast corner of Johny Mercer Drive bridge over Turners Creek

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ELEVATION REFERENCE MARKS (Continued)

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
29	0115	17.71	U.S. Coast and Geodetic Survey disk set in top of concrete post projecting 2 inches located about 681 feet southwest of intersection of Penn Waller Road and Wilmington Island Road, 29 feet northwest of center line of highway, 5 feet west of a powerpole
30	0115	16.46	nail in power pole located 25 feet west of centerline of Wilmington Island Road in line with center of Walthour Road, 1 foot above ground on east side of pole
31	0115	10.49	chiseled square 2 inches northwest of southwest end of bridge in raised walkway on northeast side of Walthour Road bridge over Bates Creek
32	0115	10.72	nail in north side of power pole located at intersection of Walthour Road and Oemler Loop South, on south side of Walthour Road
33	0115	011.84	nail in north side of power pole located at southwest corner of intersection of Walthour Road and Welch Street
34	0115	4.92	U.S. Coast and Geodetic Survey brass disk set in concrete monument located about 50 feet north of centerline of U.S. Route 80, 1.3 miles east of east end of U.S. Route 80 bridge over the Bull River
35	0120	5.23	U.S. Coast and Geodetic Survey brass disk set in concrete monument located about 50 feet north of centerline of U.S. Route 80, about 2.6 miles east of east end of U.S. Route 80 bridge over the Bull River
36	0120	9.33	U.S. Coast and Geodetic Survey brass disk set in raised lower portion of guard rail at northeast corner of bridge over South Channel leading for Fort Pulaski
37	0120	30.41	chiseled square located 3 feet east of west end of bridge in raised walkway on south side of U.S. Route 80 bridge over Lazaretto Creek

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ELEVATION REFERENCE MARKS (Continued)

REFERENCE MARK	FLOOD INSURANCE RATE MAP PANEL	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
38	0120	12.72	chiseled cross located 3 feet east of west end of bridge in raised walkway on south side of U.S. Route 80 bridge over Chimney Creek
39	0155	17.43	brass disk set in concrete monument located 31 feet west of centerline of Ferguson Avenue, 15 feet southeast of center of dirt road leading northwest
40	0155	12.86	U.S. Coast and Geodetic Survey standard disk located 22 feet northwest of the centerline of Ferguson Avenue, 0.3 mile northeast on Ferguson Avenue from the Montgomery Presbyterian Church in Burnside
41	0160	17.77	bolt set 3 feet west of east end of bridge in raised walkway on north side of Diamond Causeway bridge over the Moon River
42	0160	29.66	bolt set 3 feet east of west end of bridge in raised walkway on the south side of Diamond Causeway bridge over Skidaway Narrows
43	0160	14.47	chiseled square in curb at center of Diamond Causeway median, 30 feet west of center of McWhorther Drive, 1.0 mile east of east end of bridge over Skideway Narrows

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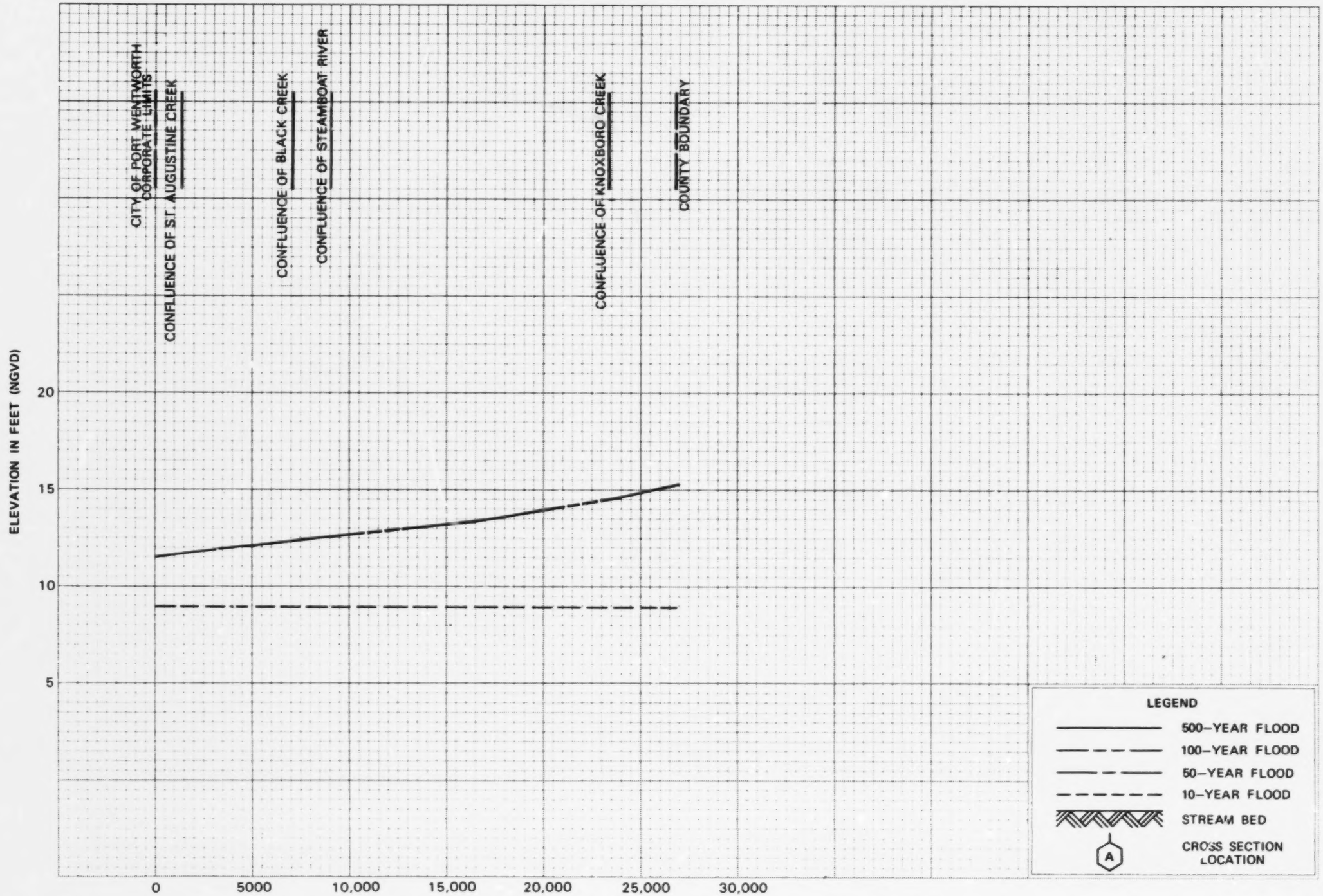

FLOOD PROFILES

SAVANNAH RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

01P

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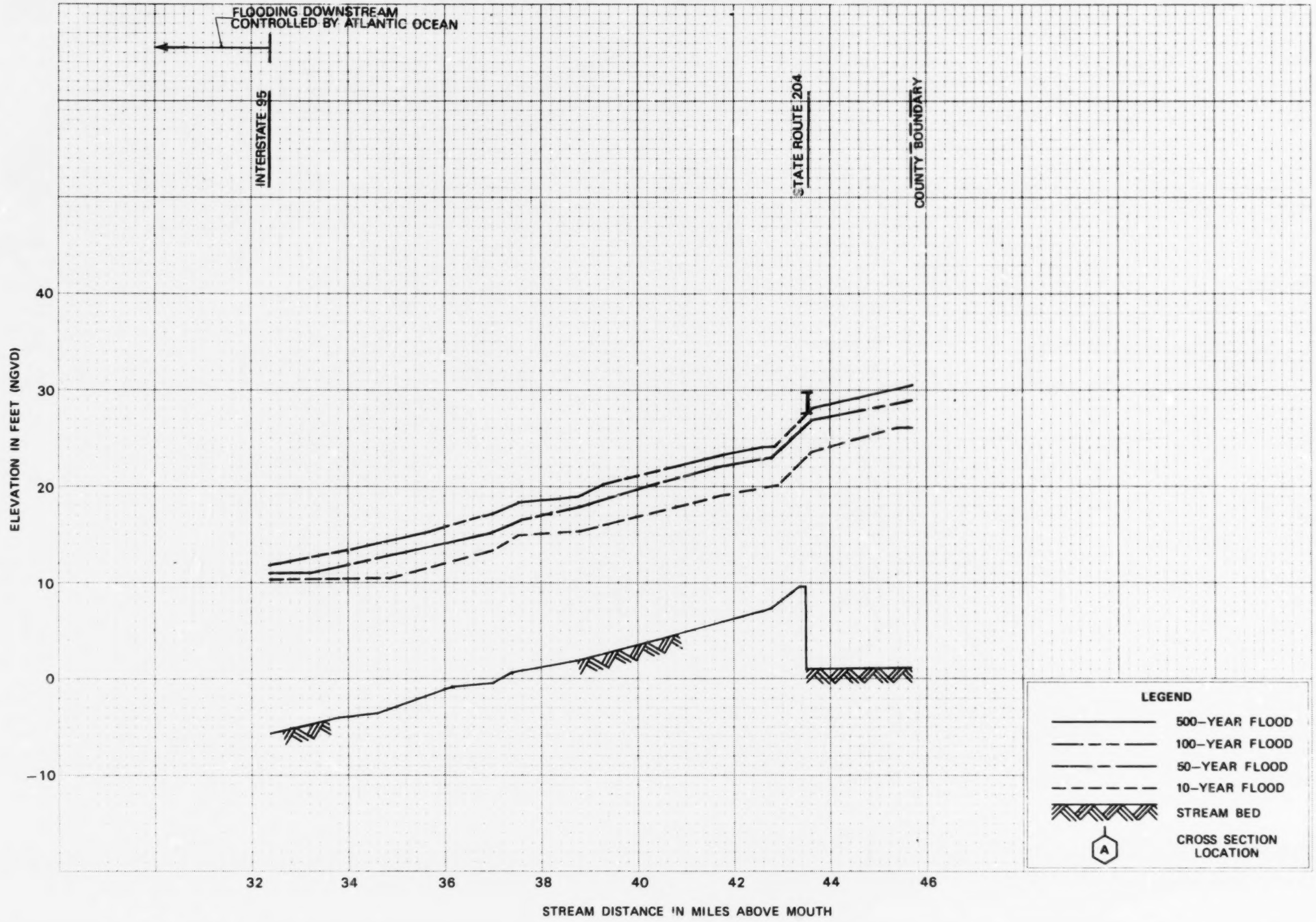

FLOOD PROFILES

OGEECHEE RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

02P

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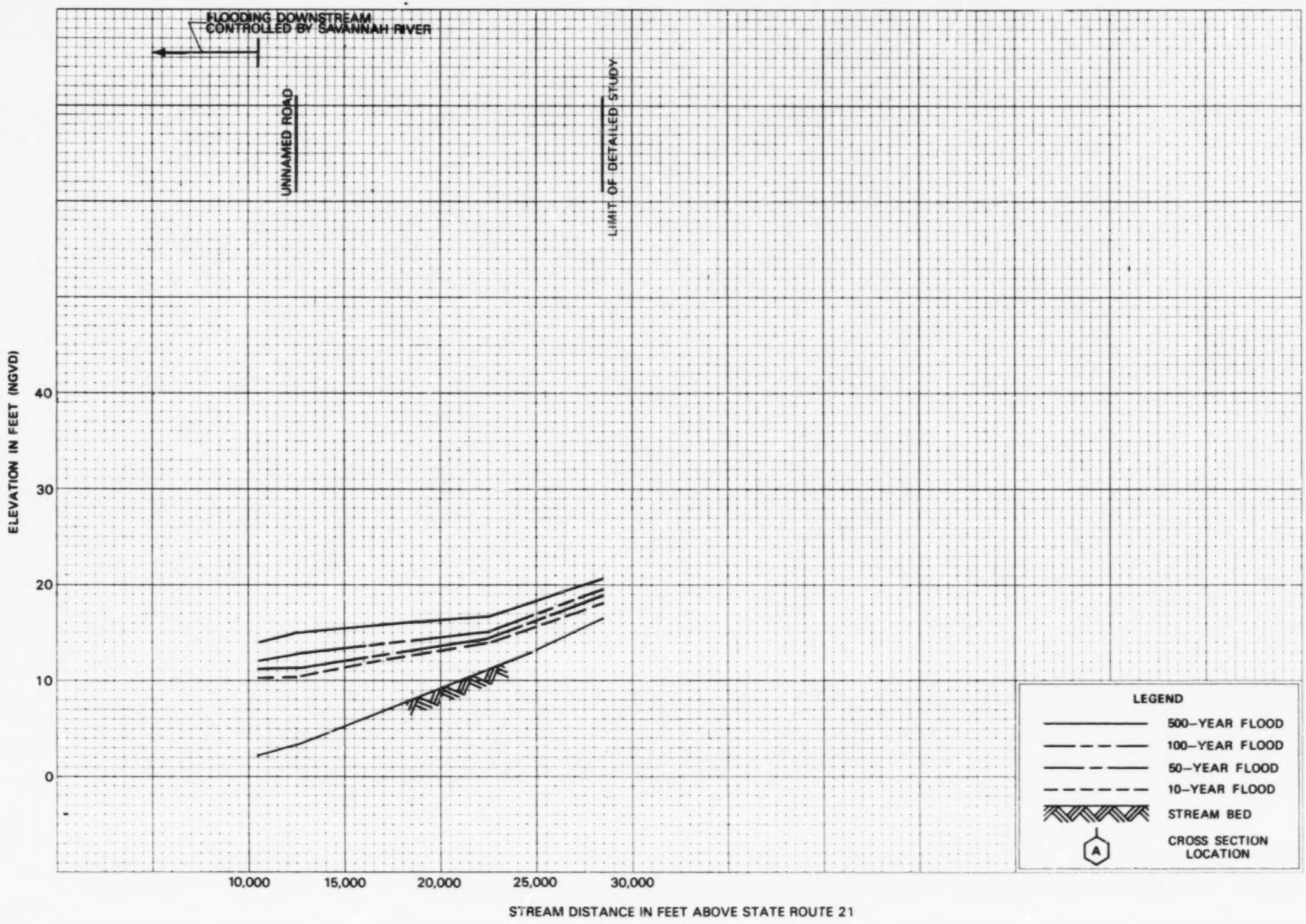

FLOOD PROFILES

ST. AUGUSTINE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

03P

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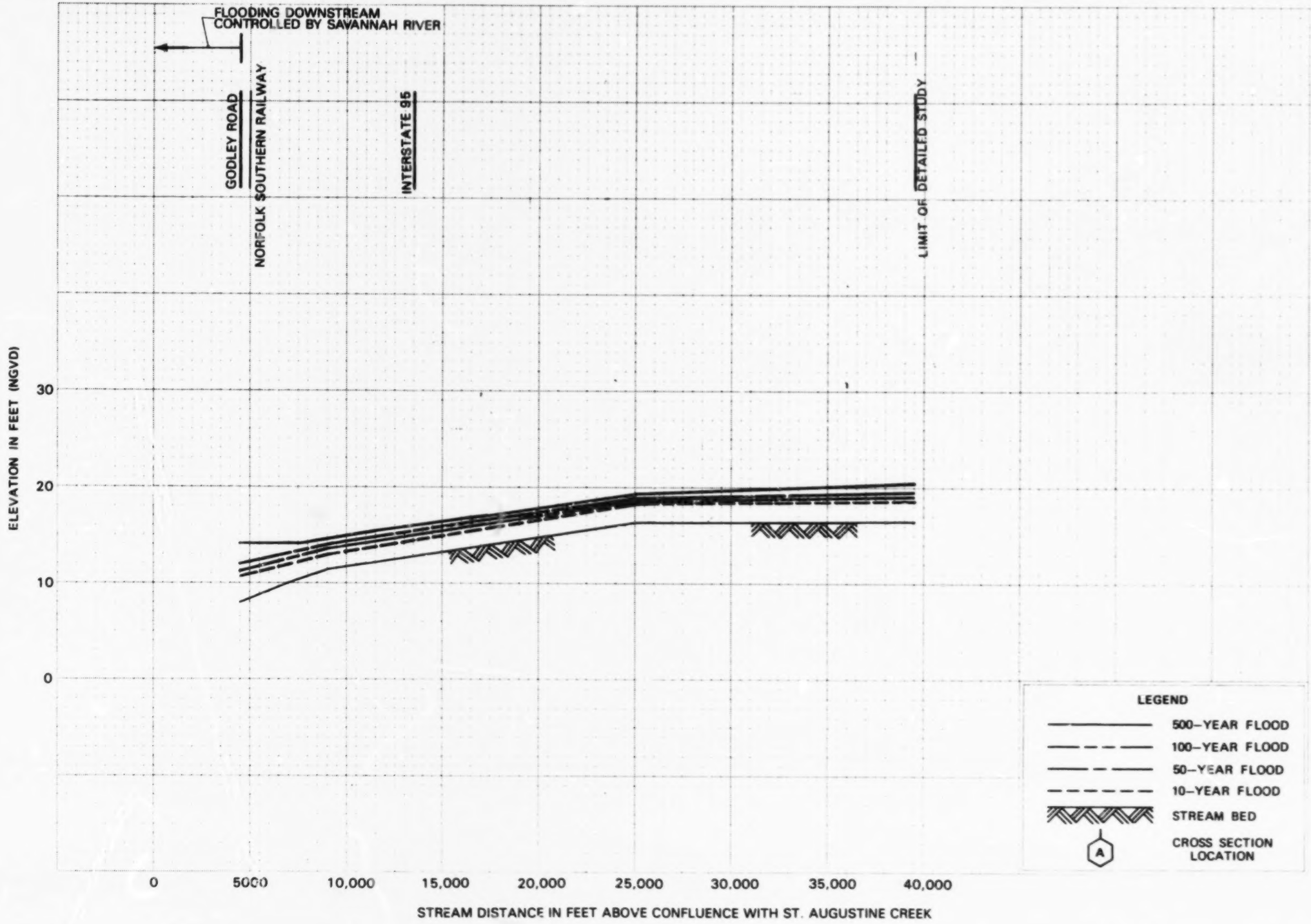

FLOOD PROFILES

ST. AUGUSTINE CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

04P

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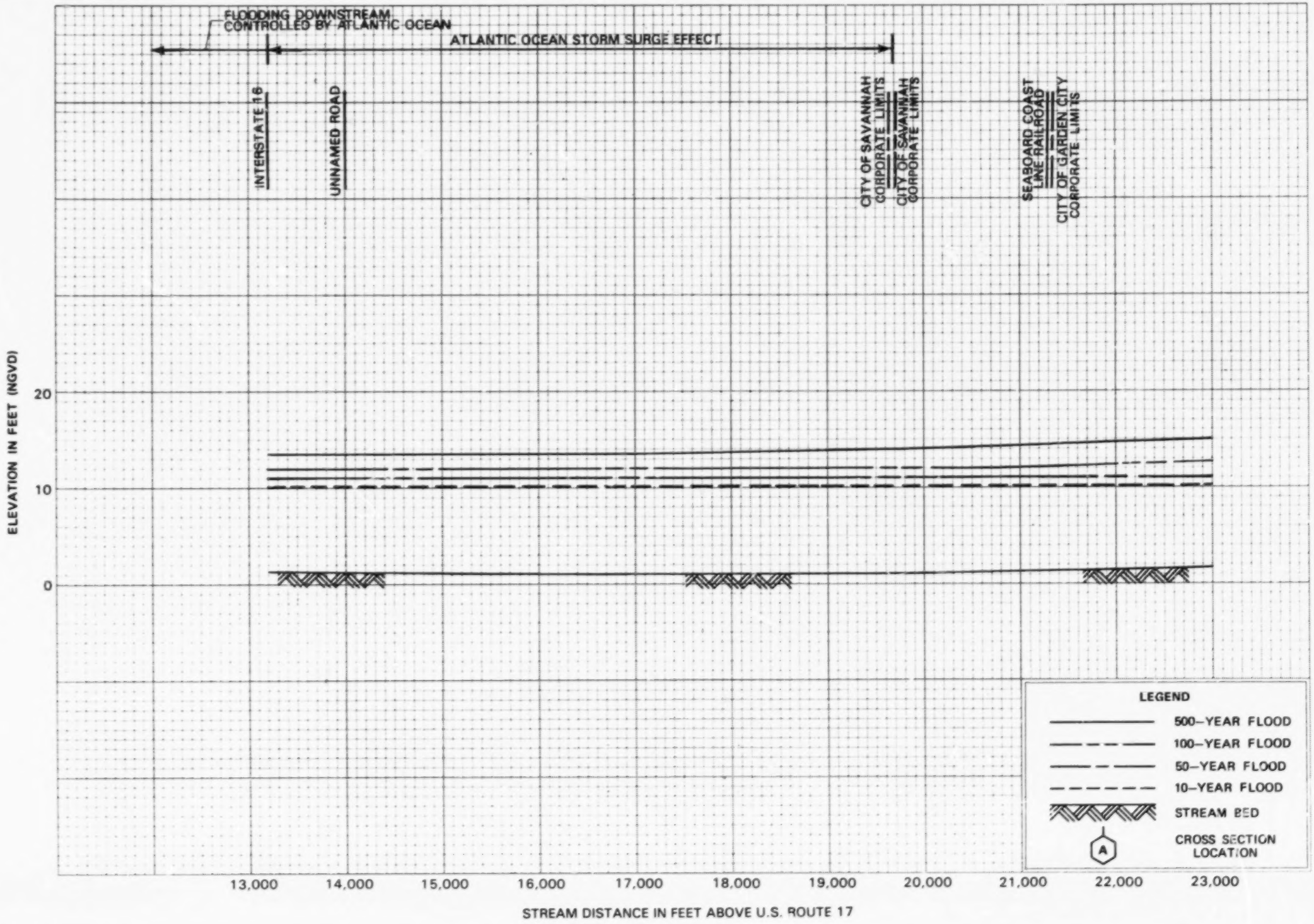

FLOOD PROFILES

SALT CREEK TRIBUTARY

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

05P

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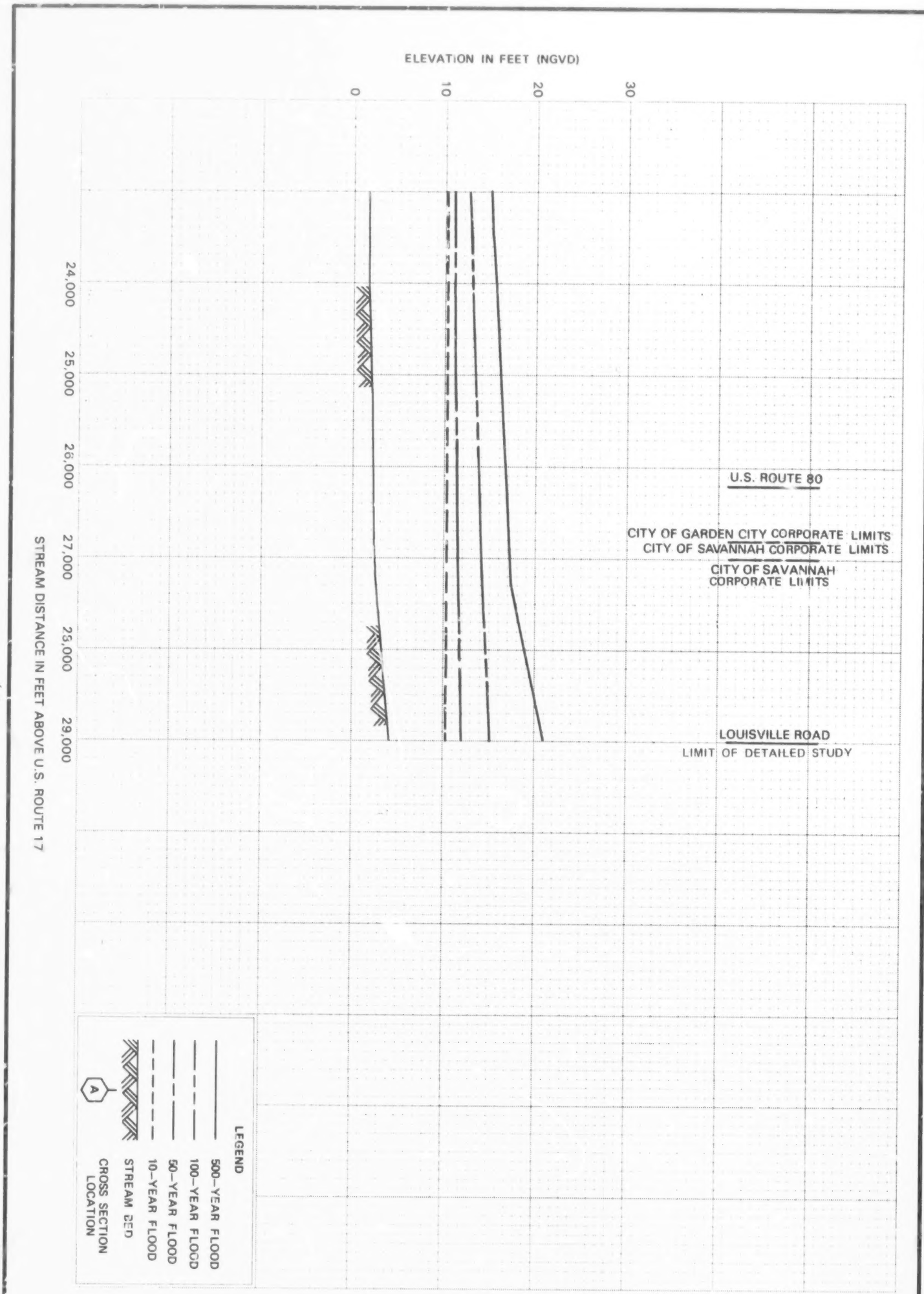

06P	FEDERAL EMERGENCY MANAGEMENT AGENCY **CHATHAM COUNTY, GA** (UNINCORPORATED AREAS)	**FLOOD PROFILES** **SALT CREEK TRIBUTARY**

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FLOODING DOWNSTREAM CONTROLLED BY ATLANTIC OCEAN

ATLANTIC OCEAN STORM SURGE EFFECT

STATE ROUTE 21

SEABOARD COAST LINE RAILROAD

SEABOARD COAST LINE RAILROAD

NORFOLK SOUTHERN RAILWAY

DEAN FOREST ROAD

CITY OF SAVANNAH CORPORATE LIMITS

CITY OF SAVANNAH CORPORATE LIMITS

CITY OF SAVANNAH CORPORATE LIMITS

ABANDONED BRIDGE

CITY OF SAVANNAH CORPORATE LIMITS

TIMBER BRIDGE

TIMBER BRIDGE

CITY OF SAVANNAH CORPORATE LIMITS

TOWN OF POOLER CORPORATE LIMITS

INTERSTATE 95

NEWTON STREET

TOWN OF POOLER CORPORATE LIMITS

CONFLUENCE OF TRIBUTARY NO. 2

CITY OF BLOOMINGDALE CORPORATE LIMITS

CITY OF GARDEN CITY CORPORATE LIMITS

CITY OF SAVANNAH CORPORATE LIMITS

CITY OF SAVANNAH CORPORATE LIMITS

ELEVATION IN FEET (NGVD)

25

20

15

10

5

0

−5

10,000 15,000 20,000 25,000 30,000 35,000 40,000 45,000 50,000 55,000 60,000

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH SAVANNAH RIVER

A B C D

LEGEND

500–YEAR FLOOD

100–YEAR FLOOD

50–YEAR FLOOD

10–YEAR FLOOD

STREAM BED

A CROSS SECTION LOCATION

FLOOD PROFILES

PIPE MAKERS CANAL

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

07P

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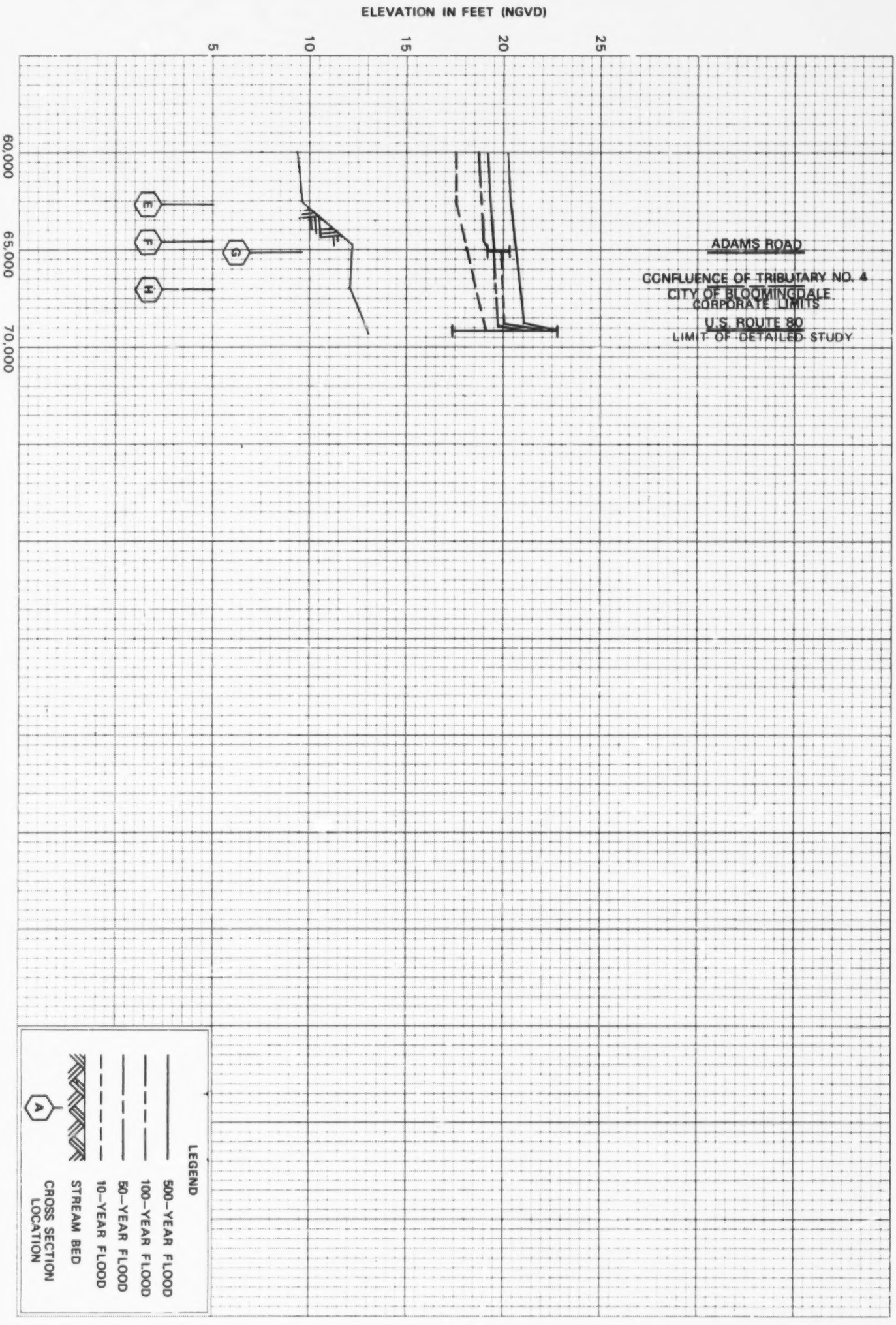

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

FLOOD PROFILES

PIPE MAKERS CANAL

08P

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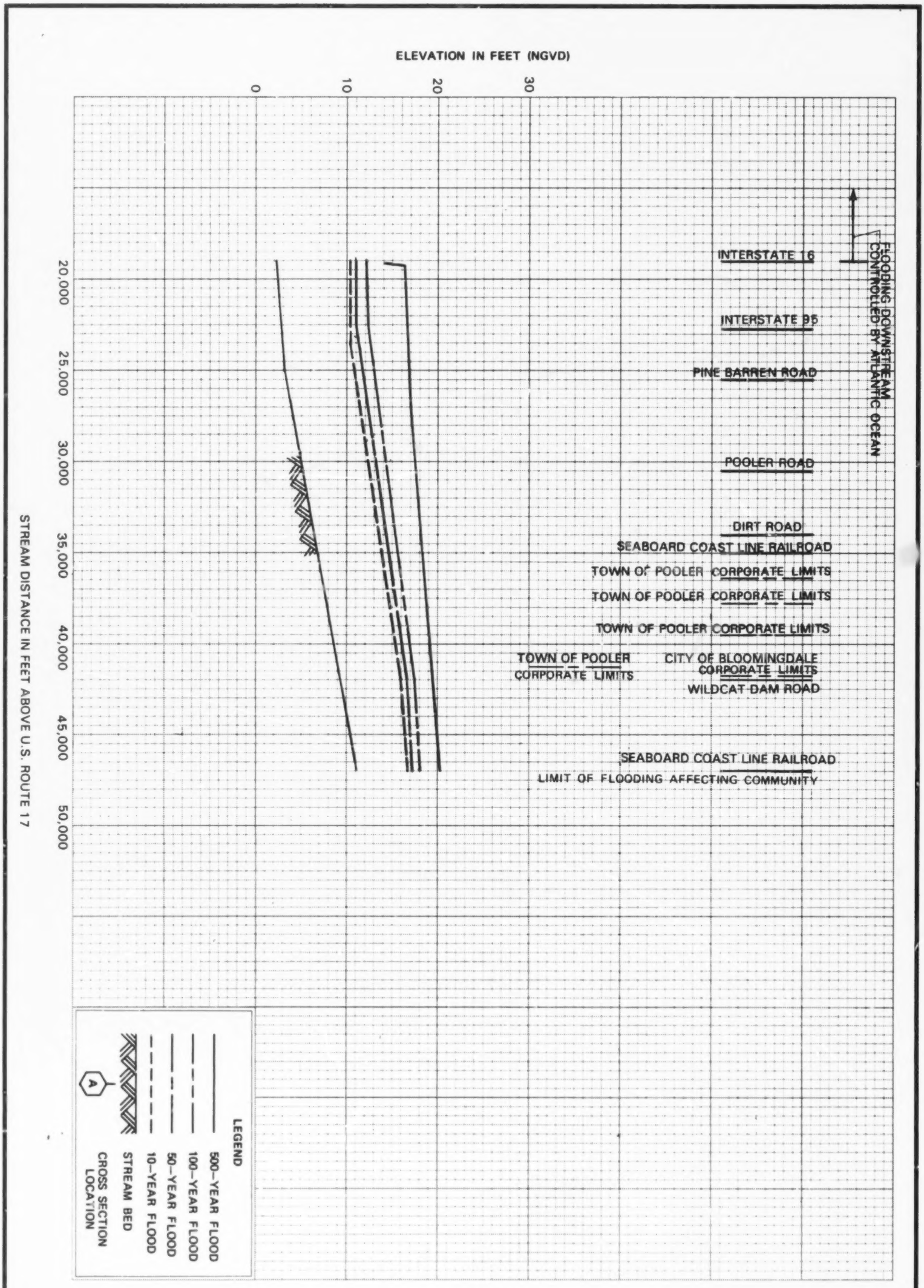

09P

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

FLOOD PROFILES

HARDIN CANAL

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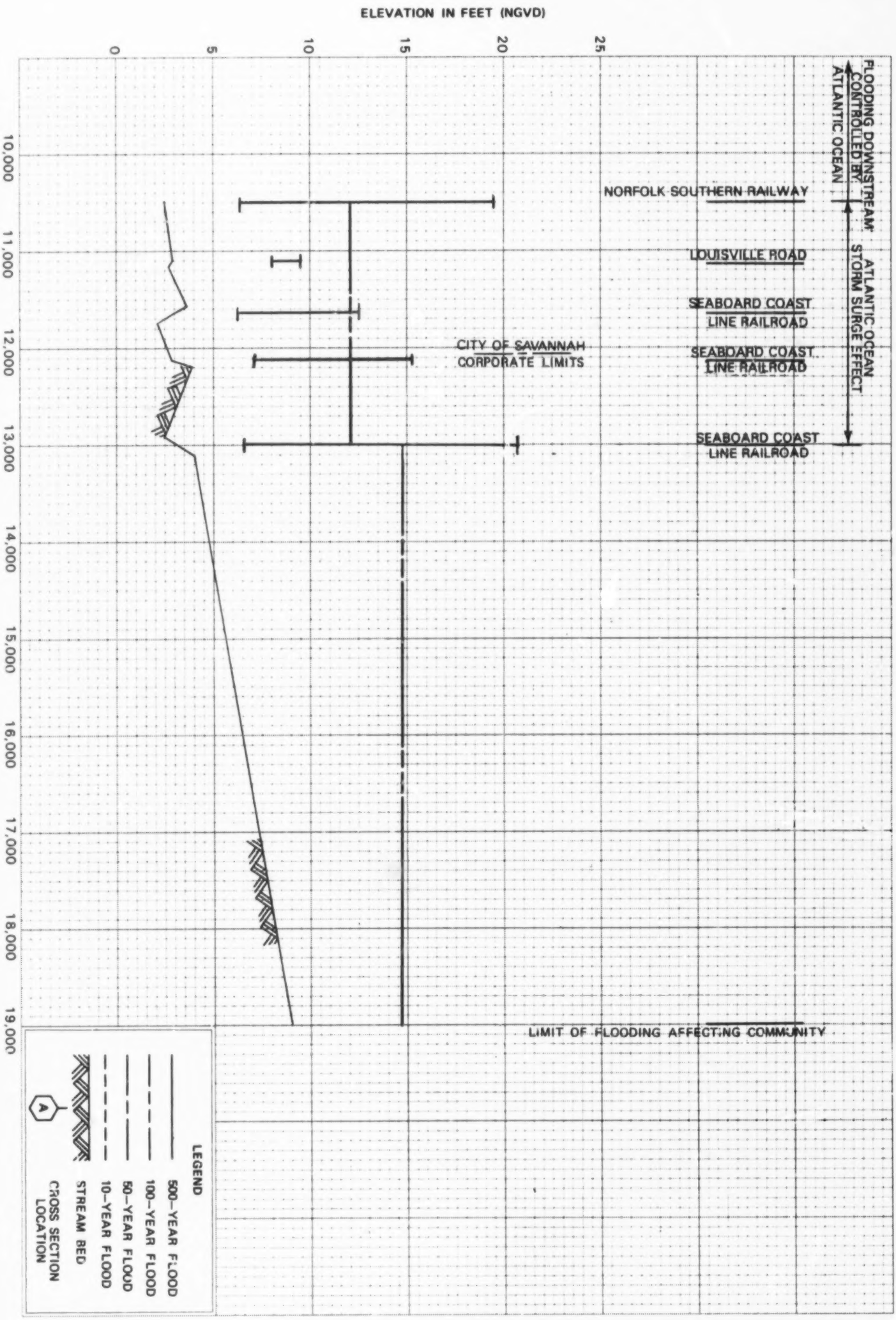

10P

FEDERAL EMERGENCY MANAGEMENT AGENCY

CHATHAM COUNTY, GA

(UNINCORPORATED AREAS)

FLOOD PROFILES

DUNDEE CANAL

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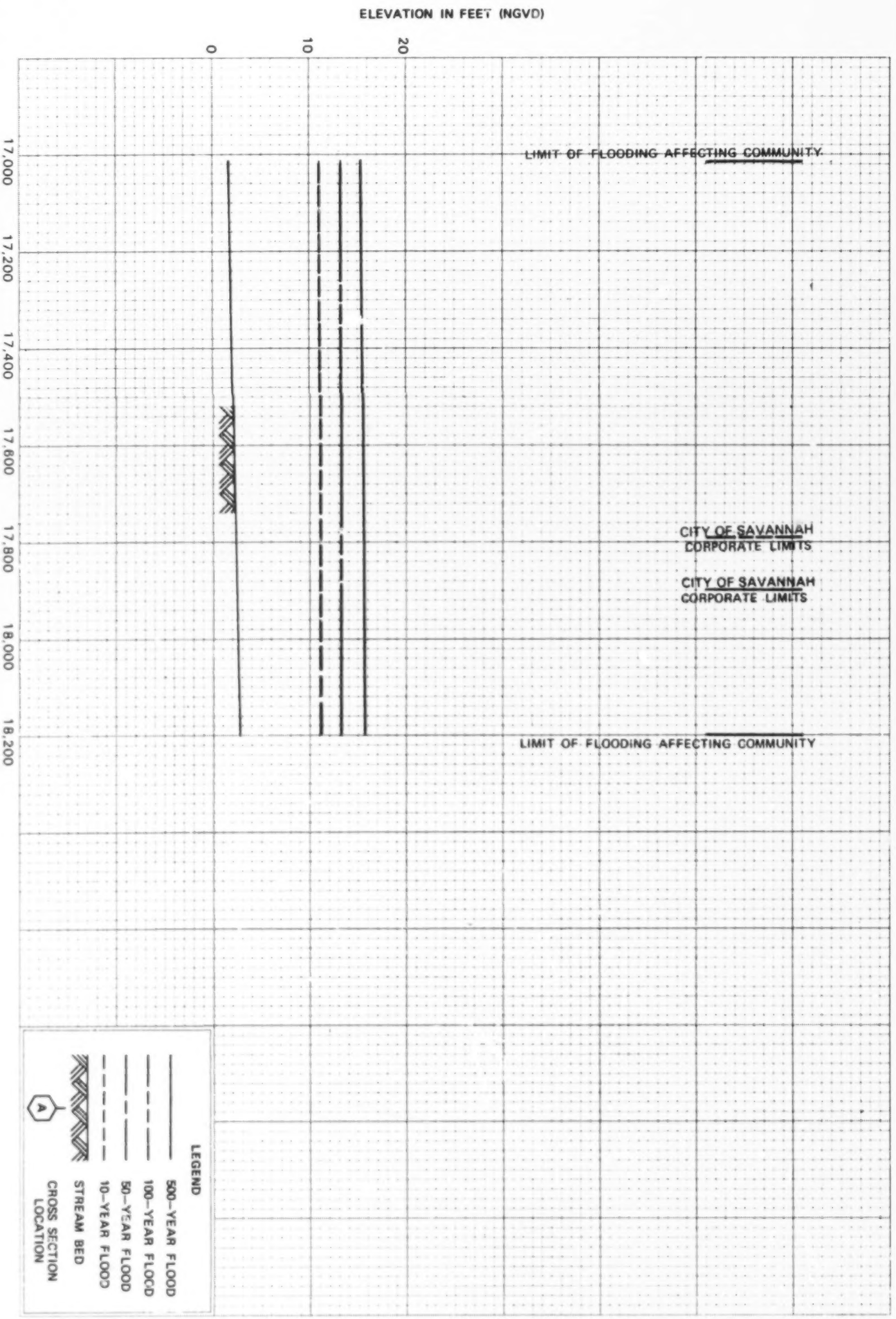

11P	FEDERAL EMERGENCY MANAGEMENT AGENCY **CHATHAM COUNTY, GA** (UNINCORPORATED AREAS)	**FLOOD PROFILES** **SPRINGFIELD CANAL**

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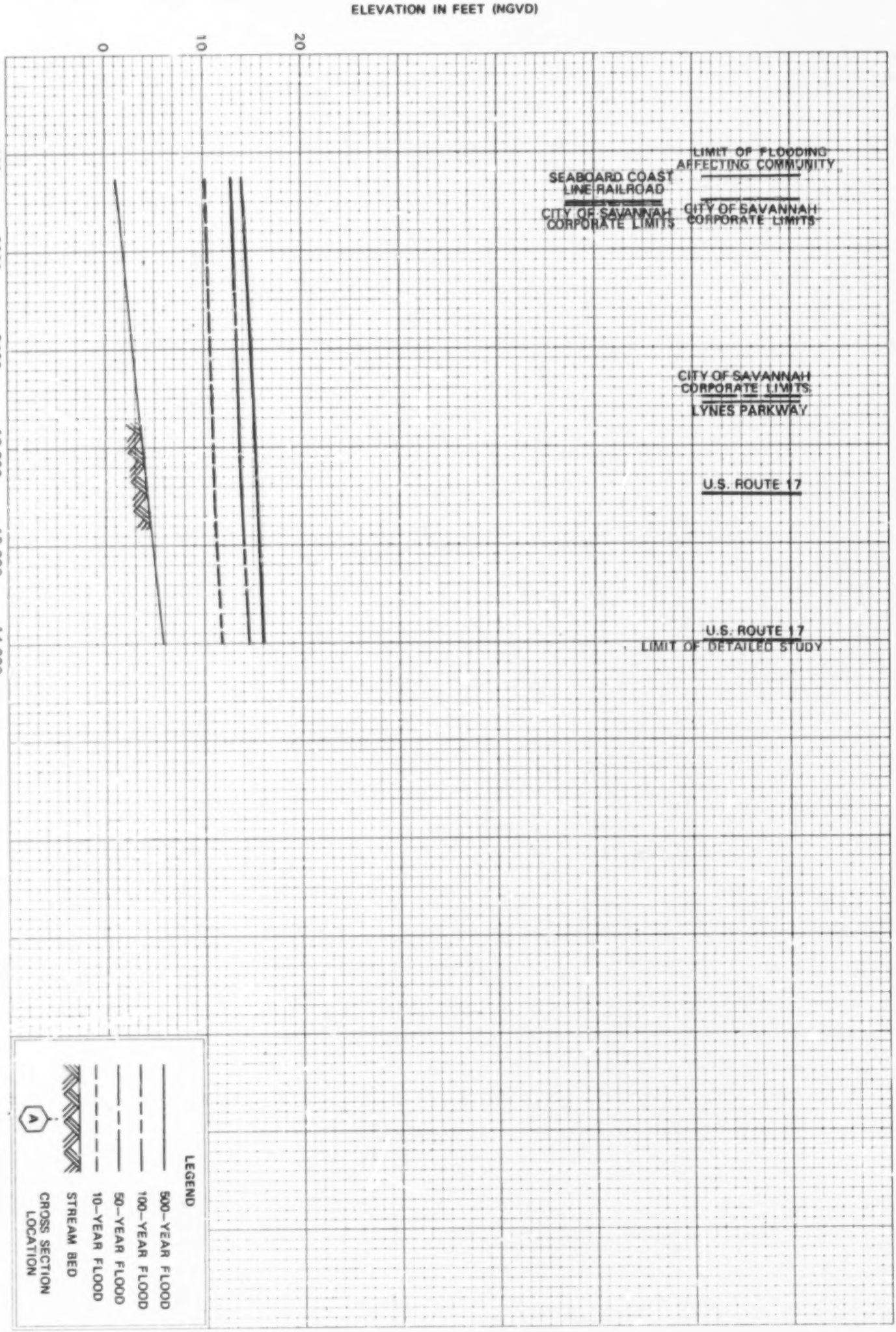

12P	FEDERAL EMERGENCY MANAGEMENT AGENCY CHATHAM COUNTY, GA (UNINCORPORATED AREAS)	FLOOD PROFILES SPRINGFIELD CANAL TRIBUTARY A

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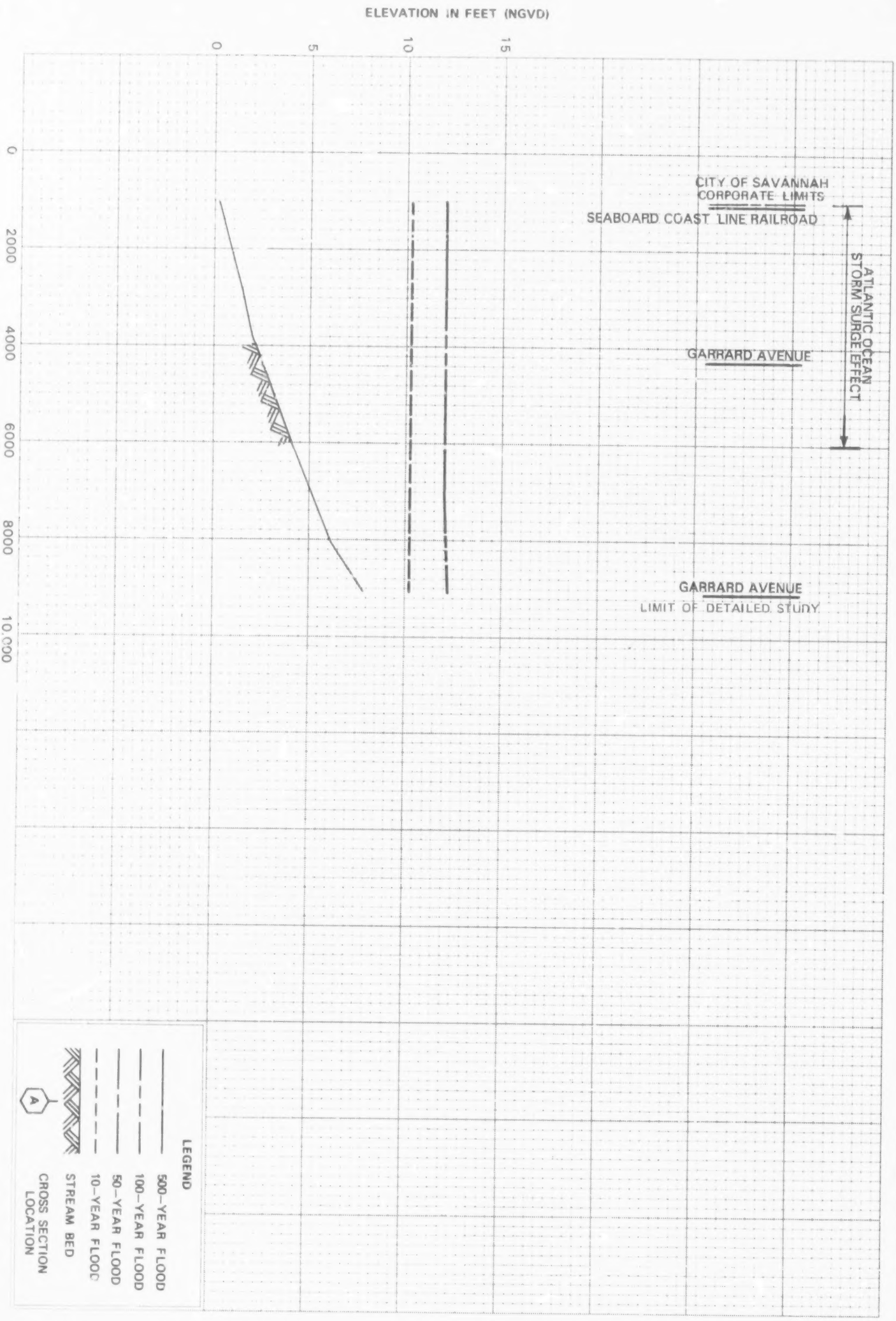

13P	FEDERAL EMERGENCY MANAGEMENT AGENCY CHATHAM COUNTY, GA (UNINCORPORATED AREAS)	FLOOD PROFILES LOWER SPRINGFIELD CANAL TRIBUTARY

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